

**REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM BETWEEN IP AUSTRALIA (IPAU) AND THE USPTO**

Application No.:	10/579,654	First Named Inventor:	Paul Meredith
Filing Date:	18 May 2006	Attorney Docket No.:	6106-000006/US/NP
Title of the Invention:	Silica films and method of production thereof		

THIS REQUEST FOR PARTICIPATION IN THE PPH PILOT PROGRAM ALONG WITH THE REQUIRED DOCUMENTS MUST BE SUBMITTED VIA EFS-WEB. INFORMATION REGARDING EFS-WEB IS AVAILABLE AT [HTTP://WWW.USPTO.GOV/EBS/EFB\\_HELP.HTML](http://www.uspto.gov/ebs/efs_help.html).

**APPLICANT HEREBY REQUESTS PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM AND PETITIONS TO MAKE THE ABOVE-IDENTIFIED APPLICATION SPECIAL UNDER THE PPH PILOT PROGRAM.**

The above-identified application (1) validly claims priority under 35 U.S.C. 119(a) and 37 CFR 1.55 to one or more corresponding IPAU application(s) or to a PCT application that does not contain any priority claim, or (2) is a national stage entry of a PCT application that does not contain any priority claim.

The IPAU/PCT application number(s) is/are: 2004291564

The filing date of the IPAU/PCT application(s) is/are: 22 November 2004

**I. List of Required Documents:**

- a. A copy of all IPAU office actions (which are relevant to patentability) in the above-identified IPAU application(s)

☒ Is attached.

- b. A copy of all claims which were determined to be patentable by IPAU in the above-identified IPAU application(s)

☒ Is attached.

- c. (1) An information disclosure statement listing the documents cited in the IPAU office actions

☒ Is attached.

☐ Has already been filed in the above-identified U.S. application on \_\_\_\_\_

- (2) Copies of all documents (except for U.S. patents or U.S. patent application publications)

☒ Are attached.

☐ Have already been filed in the above-identified U.S. application on \_\_\_\_\_

## REQUEST FOR PARTICIPATION IN THE PATENT PROSECUTION HIGHWAY (PPH) PILOT PROGRAM BETWEEN IPAU AND THE USPTO

Application No.:	10/579,654	First Named Inventor:	Paul Meredith
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**The petition fee under 37 CFR 1.17(h) as required by 37 CFR 1.102(d) must be paid via EFS-Web (using credit card, authorization to charge a deposit account, or electronic funds transfer).**

Nov. 12, 2008

DAVID A. McCLAUGHRAY

**37,885**  
Registration Number



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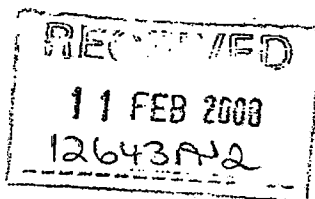
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08 February 2008

Fisher Adams Kelly  
GPO Box 1413  
Brisbane QLD 4001  
Australia



Your Ref:

Examiner's first report on patent application no. 2004291564  
by The University of Queensland

Last proposed amendment no. 1

Dear Madam/Sir,

I am replying to the request for examination. I have based this report on the pamphlet, the amendments already made under the Articles of the PCT filed on 6 December 2005 and the statement of proposed amendments under S104 of 17 August 2007. I have examined the application and I believe that there are lawful grounds of objection to the application. These grounds of objection are:

1. There is no Notice of Entitlement on file. You will need to file one because an application without a Notice of Entitlement cannot be accepted.
2. Claims 1-3, 8-12, 24, 25, 27, 29 are not novel (and not inventive) in light of the following document.  
D1. US 5698266 A (Floch et al) 16 December 1997  
D1 appears to disclose the formation of a precursor solution comprising silicic acid tetramethyl ester homopolymer wherein the precursor solution is spin coated onto a substrate and cured with ammonia vapour treatment (Figure 7 and Example 1). D1 also disclose the silica film having a refractive index of 1.22.
3. Claims 4-7 lack an inventive step in light of the following document.  
D1. US 5698266  
D1 does not disclose the feature of claims 4-7 of the silica precursor comprising methyl-silicate-51 (MS-51). However, this feature is not considered to be inventive as it is merely a commercial product which appears to be equivalent to the precursor solution produced in Example 1 of D1.
4. Claims 18-20, 22 lack an inventive step in light of the following document.  
D1. US 5698266  
D1 does not disclose the feature of claim 18 of the thickness of the coating being less than 100µm. However, this feature is not considered to be inventive as it common in the art of preparing silica films to prepare films having a thickness of less than 100µm. Furthermore, prior art documents such as EP 834488 (cited in ISR) disclose silica film having a thickness of between 10 to 270 nm (Examples 1-11, Table 1).

You have 21 months from the date of this report to overcome all my objection(s) otherwise your application will lapse.

You will need to pay a monthly fee for any response you file after 12 months from the date of the first report.

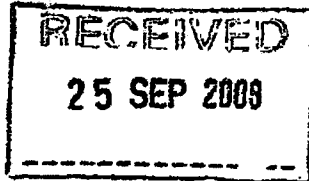
You will also need to pay any annual continuation fees that apply. These will normally be first due five years from the filing date. Please note however that earlier commencement dates apply for divisional applications.

Information about fees may be obtained by phoning 1300 651 010.

Yours faithfully,

RANDALL ENGLISH  
Patent Examination A  
B2 - Chem/Biotech  
Phone: (02) 6283 2744

22 September 2008



DATA ENTERED		DUE DATE(S) ENTERED	
PA	029	DUE	/ /
DATE	25/9/9	DUE	/ /
		DUE	/ /



Australian Government

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Fisher Adams Kelly  
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RE: Patent Application number 2004291564  
in the name(s) of Xerocoat Pty Limited.

Your Ref: 12643AU2-DMK/SPW

Dear Sir/Madam

Notice of Acceptance

I am pleased to advise that there are no objections to the application. The Examiner has incorporated into the complete specification amendments made under PCT Article 34 and/or Section 104 based on the following:

PCT: - Art 34

S104 amendments up to and including item number: - 2

The application and complete specification were accepted on 22 September 2008 and a notice of the acceptance will appear in the Supplement to the Australian Official Journal of Patents on 2 October 2008.

For applications filed after 31 August 2002 or that entered National Phase after 31 August 2002, a fee for acceptance of an application applies. This fee includes a component determined by the number of claims in excess of 20. If the acceptance fee applies and has not been paid, an Invitation to Pay (ITP) will issue. If the amount is paid by the due date, your patent will be sealed as soon as practicable after the 3 month period for opposition has expired. The total number of claims at acceptance has been reported as: 29

If you need any further information please contact (02) 6283 2898. Alternatively, you may contact us by email at [assist@ipaustalia.gov.au](mailto:assist@ipaustalia.gov.au).

Yours faithfully

Electronic Records Administration

## **Bibliographic Details at Acceptance**

**PAMS Details for Patent Application No. 2004291564**

**Your Reference:** 12643AU2-DMK/SPW

**Acceptance Date:** 22 September 2008

**Acceptance to be Advertised:** 2 October 2008

**Complete Filing Date:** 22 November 2004

**OPI Date:** 2 June 2005

**National Phase Entry Date:** 15 May 2006

**Applicant Name:** Xerocoat Pty Limited

**Address:** C/- Uniquet Pty Limited, Level 7, General Purpose South  
Building, Staff House Road, The University of Queensland,  
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Australia

**Inventor Name(s):** Harvey, Michael  
Meredith, Paul

**Title:** Silica films and method of production thereof

**Agent Name:** Fisher Adams Kelly

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Australia

**Address for Legal Service:** 29/12 Creek Street  
Brisbane QLD 4000  
Australia

**Prior Art Documents:**  
US 5698266

### **Priority Details:**

<b>Date</b>	<b>Application Number</b>	<b>Country</b>
21 November 2003	2003906427	Australia

### **Int. Cl.**

**C01B 33/12** (2006.01)  
**C03C 1/00** (2006.01)  
**C03C 17/00** (2006.01)  
**C03C 17/25** (2006.01)

*C09D 183/02* (2006.01)

**Continuation Fee Due Date:** 22 November 2009

## CLAIMS

1. A method of forming a silica film coated on a substrate including the steps of:  
  
producing a silica precursor formulation having a water content of no more than 5% by volume by adding silicic acid tetramethyl ester homopolymer to a solvent;  
  
coating a substrate with the silica precursor formulation; and  
  
curing the silica precursor formulation onto the substrate in a vaporous ammoniacal environment.
2. The method of claim 1 wherein the solvent is alcohol or an alcohol-aqueous solution.
3. The method of claim 1 wherein the silica precursor formulation contains an amount of tetramethoxysilane.
4. The method of claim 1 and claim 2 wherein the silica precursor formulation is formed by adding methyl-silicate-51 (MS-51), comprising >94% silicic acid tetramethyl ester homopolymer by volume, <3% tetramethoxysilane by volume and <3% methanol by volume, to the solvent.
5. The method of claim 4 wherein the silica precursor formulation comprises about 0.2-100 parts alcohol by volume and 0.01-1 parts water by volume for each part of MS-51.
6. The method of claim 5 wherein the silica precursor formulation comprises about 0.2-15 parts alcohol by volume and 0.01-0.1 parts water by volume for each part of MS-51.
7. The method of claim 6 wherein the ratio of reagents in the silica precursor



formulation is 1.0 part MS-51: 0.1 parts water: 10.0 parts alcohol by volume.

8. The method of claim 1 wherein the coating is performed by spin coating or dipping.
9. The method of claim 1 wherein the coating further includes allowing the coating to settle before curing.
10. The method of claim 1 wherein the curing is carried out by placing the coated substrate in a closed ammoniacal environment.
11. The method of claim 10 wherein the ammoniacal environment contains water, ammonia and alcohol.
12. The method of claim 11 wherein the solvent used in the formation of the silica precursor is an alcohol, and the alcohol contained in the ammoniacal environment is the same alcohol as used in the formation of the silica precursor.
13. The method of claim 1 further including controlling the solvent content to control characteristics of the silica film.
14. The method of claim 11 further including controlling the alcohol content in the ammoniacal environment to control characteristics of the silica film.
15. The method of claim 1 further including controlling a pore size of the silica film by controlling the solvent content and type in the silica precursor formulation.
16. The method of claim 1 further including controlling a pore density of the silica film by controlling the solvent content and type in the ammoniacal environment.
17. The method of claim 12 further including controlling a porosity of the silica film by controlling the solvent content and type in the precursor formulation and

18. A silica film having a refractive index between 1.1 and 1.56 and a film thickness less than 100 microns formed by a method including the steps of:  
producing a silica precursor formulation having a water content of no more than 5% by volume by adding silicic acid tetramethyl ester homopolymer to a solvent;  
coating a substrate with the silica precursor formulation; and  
curing the silica precursor formulation onto the substrate in a vaporous ammoniacal environment.
19. The silica film of claim 18 having a thickness of less than 1 $\mu$ m.
20. The silica film of claim 18 comprising a continuous, interconnected, nanoporous silica network.
21. The silica film of claim 18 comprising a hardness greater than 7H on pencil scale.
22. The silica film of claim 18 wherein the film is resistant to washing with water, alcohols, common acids and alkalis.
23. The silica film of claim 18 wherein the film is anti-fogging.
24. Use of the silica film formed by the method of claim 1 in a coating on a transparent substrate to provide an anti-reflective and/or anti-fogging and/or protective coating
25. An anti-reflection coating for a transparent substrate comprised by a silica film formed according to the method of claim 1.
26. An anti-fogging coating for a transparent substrate comprised by a silica film formed according to the method of claim 1.
27. An anti-scratch coating for a substrate comprised by a silica film formed

according to the method of claim 1.

28. An anti-static coating for a substrate comprised by a silica film formed according to the method of claim 1.

29. A method of forming a silica film coated on a substrate including the steps of:

producing a silica precursor formulation having a water content of no more than 5% by volume by adding silicic acid tetramethyl ester homopolymer to a solvent;

coating a substrate with the silica precursor formulation;

placing the coated substrate in a closed solvent environment;

establishing equilibrium between the solvent in the precursor formulation and the solvent environment; and

curing the silica precursor formulation onto the substrate in an ammoniacal environment containing solvent by introducing ammonia vapour and water vapour to the closed solvent environment.